

Managing Transuranic Waste at the Nevada Test Site

Transuranic waste is one of several types of waste handled by the U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office (NNSA/NV) at the Nevada Test Site (NTS). **Transuranic waste** contains man-made radioactive elements heavier than uranium, hence the name “trans” or “beyond” uranium. In addition to radioactive materials, hazardous waste components may also be present in the transuranic waste. Hazardous waste, as identified by the U.S. Environmental Protection Agency, refers to waste that is harmful to human health or that may impact the environment. Substances such as ethyl alcohol, Freon, and various metals are classified as hazardous waste. **Transuranic waste** that contains both radioactive and hazardous components is referred to as **mixed transuranic waste** and is managed in accordance with a signed agreement between the U.S. Department of Energy (radioactive component) and the State of Nevada (hazardous component).

Most of the transuranic waste currently stored at the NTS was generated as part of a U.S. nuclear weapons research and development program at Lawrence Livermore National Laboratory near Oakland, California. This legacy waste, which was shipped to the NTS for temporary storage between 1974 and 1990, includes protective clothing and miscellaneous equipment contaminated with transuranic elements. Additionally, a small quantity of the **transuranic waste** stored at the NTS was generated by environmental restoration activities on the NTS and the Tonopah Test Range.

Waste Handling and Storage

Most transuranic elements decay by emitting alpha particles. Alpha radiation, the least penetrating form of radiation, can be stopped by a sheet of paper and cannot penetrate human skin. However, an alpha-emitting isotope can enter the body through inhalation, ingestion, or through a cut on the skin. Therefore, **transuranic waste** requires special handling, storage, and disposal.

Approximately 23,700 cubic feet (671 cubic meters) of **transuranic** and **mixed transuranic waste** was received at

the NTS to be stored and characterized. The waste is contained in metal drums and metal boxes which are housed in a steel-framed, fabric-covered building at the Area 5 Radioactive Waste Management Site. This structure rests on a 2.1-acre (8,500-square meter) asphalt pad, which contains a protective waterproof layer to prevent moisture from seeping into the soil as well as an 8-inch (20-centimeter) curb to prevent run-on and runoff. NNSA/NV waste management specialists further ensure safety by regularly inspecting waste packages to verify that labels are intact and legible and that the containers remain structurally sound. Access to the facility is also controlled. These precautions are part of a comprehensive health and safety program designed to protect NTS personnel, the public, and the desert environment.

Waste Characterization

Transuranic and **mixed transuranic waste** stored at the NTS is destined for permanent disposal at the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico. In order for the



Transuranic Waste Storage Building



Interior

waste to be accepted for disposal at WIPP, each waste package must be characterized and certified in accordance with the WIPP acceptance criteria.

An extensive characterization program designed to identify the physical and chemical components of the waste products is in place at the Waste Examination Facility (WEF) located just outside the Area 5 Radioactive Waste Management Site.

Within the WEF, designated waste is processed through the Visual Examination and Repackaging Building glovebox, which is designed to allow personnel to open, inspect, sort, and repackage **transuranic waste** without direct contact. The building's contained, controlled and monitored environment includes high-efficiency particulate air filters to ensure that all building exhaust being released in the atmosphere meets air quality standards.

Some waste characterization is also performed by mobile vendors. If any of these characterization techniques identify a need for additional waste treatment prior to disposal at WIPP, appropriate treatment methods will be identified and applied prior to shipment.

The Waste Isolation Pilot Plan (WIPP), located near Carlsbad, New Mexico, is the world's first underground repository licensed to permanently dispose of transuranic waste. Disposal rooms at the WIPP are mined to depths of 2,150 feet below the surface and are surrounded by a 2,000-foot thick salt formation that has been stable for more than 200 million years. Over the next 35 years, WIPP is expected to receive approximately 37,000 waste shipments. For more information on WIPP's disposal program, visit the WIPP website at: <http://www.wipp.carlsbad.nm.us/>

Regulatory Commission and U.S. Department of Transportation requirements before transport. Decisions regarding routes are determined following extensive negotiations with the states in which proposed routes are located. The WIPP assumes official responsibility for NTS **transuranic waste** once it has been loaded into the TRUPACT-II containers. This responsibility includes providing transportation and shipping oversight. Waste shipments from the NTS to WIPP are expected to begin in 2002.

Waste Transportation to WIPP

Transuranic waste, once certified, is shipped inside specially designed containers provided by WIPP.

These containers, known as TRUPACT-II, can hold up to 14 fifty-five gallon waste drums, two standard waste boxes, or one 10-drum overpack. Each truck can transport up to three TRUPACT-II containers at one time. All waste shipments must meet stringent U.S. Nuclear



TRUPACT-II containers

Public Involvement

Community outreach activities, such as workshops and Community Advisory Board (CAB) meetings, provide stakeholders and the general public the opportunity to become involved in and learn more about programs such as this. Specific dates, times, and locations of community outreach activities can be obtained by using the information listed below.



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